

What is claimed:

1 1. An intervertebral implant comprising:
2 a first part that is adapted to mate with a first vertebra;
3 a second part that is adapted to mate with a second vertebra;
4 and
5 a third part that mates with the first part and the second part,
6 with the third part having a first curved surface that mates with the first
7 part and a second curved surface that mates with the second part and
8 with the first curved surface directed oppositely to and provided at an
9 angle to the second curved surface.

1 2. The implant of claim 1 wherein:
2 the first part has a first socket that receives the first curved
3 surface and the second part has a second socket that receives the
4 second curved surface.

1 3. The implant of claim 1 wherein the first part has a first keel that
2 is adapted to be inserted in a first vertebra and the second part has a second
3 keel that is adapted to be inserted in a second vertebra.

1 4. The implant of claim 1 wherein the first curved surface allows
2 the implant to move between anterior and posterior directions and the second
3 curved surface allows the implant to move laterally.

1 5. The implant of claim 3 wherein the first and second keels are
2 about parallel to a first axis of movement of one of the first part and the
3 second part about the third part and the first and second keels are about
4 perpendicular to a second axis of movement of the other of the first part and
5 the second part about the third part.

1 6. The implant of claim 5 wherein:

2 the first part has a first socket that receives the first curved
3 surface and the second part has a second socket that receives the
4 second curved surface.

1 7. An intervertebral implant comprising:
2 a first part that is adapted to mate with a first vertebra;
3 a second part that is adapted to mate with a second vertebra;
4 and
5 a third part that mates with the first part and the second part with
6 the third part having a first convex surface that mates with the first part
7 and a second convex surface that mates with the second part and with
8 the first convex surface directed oppositely to and provided at an angle
9 to the second convex surface.

1 8. The implant of claim 7 wherein:
2 the first part has a first socket that receives the first convex
3 surface and the second part has a second socket that receives the
4 second convex surface.

1 9. The implant of claim 7 wherein the first part has a first keel that
2 is adapted to be inserted in a first vertebra and the second part has a second
3 keel that is adapted to be inserted in a second vertebra.

1 10. The implant of claim 7 wherein the first convex surface allows
2 the implant to move between anterior and posterior directions and the second
3 convex surface allows the implant to move laterally.

1 11. The implant of claim 9 wherein the first and second keels are
2 about parallel to a first axis of movement of one of the first part and the
3 second part about the third part and the first and second keels are about
4 perpendicular to a second axis of movement of the other of the first part and
5 the second part about the third part.

1 12. The implant of claim 11 wherein:
2 the first part has a first socket that receives the first convex
3 surface and the second part has a second socket that receives the
4 second convex surface.

1 13. An intervertebral implant comprising:
2 a first plate adapted to mate to a first vertebral body, the first
3 plate including a first socket having a first interior surface wherein the
4 first interior surface has a curved shape and a first wall and a second
5 wall;
6 a second plate adapted to mate to a second vertebral body, the
7 second plate including a second socket having a second interior
8 surface; and
9 a spacer with a first side that fits adjacent the first interior
10 surface of the first socket and a second side that fits adjacent the
11 second interior surface of the second socket.

1 14. The implant of claim 13 including at least one of the first and
2 second plates including a keel extending therefrom and adapted to engage a
3 vertebral body.

1 15. The implant of claim 13 including a first keel extending from the
2 first plate and adapted to engage a first vertebral body, and a second keel
3 extending from the second plate and adapted to engage a second vertebral
4 body.

1 16. The implant of claim 13 wherein the first plate has a first side
2 and a second side, wherein the first side faces the second plate and the
3 second side contacts a surface of the first vertebral body.

1 17. The implant of claim 16 wherein the first side of the first plate
2 and the second side of the first plate are parallel to each other.

1 18. The implant of claim 16 wherein the first side of the first plate
2 and the second side of the first plate are not parallel to each other.

1 19. The implant of claim 13 wherein the second plate has a first side
2 and a second side and the first side of the second plate faces the first plate
3 and the second side of the second plate contacts a surface of the second
4 vertebral body.

1 20. The implant of claim 19 wherein the first side of the second plate
2 and the second side of the second plate are parallel to each other.

1 21. The implant of claim 19 wherein the first side of the second plate
2 and the second side of the second plate are not parallel to each other.

1 22. The implant of claim 13 wherein the first socket of the first plate
2 has first and second side walls that are parallel to each other.

1 23. The implant of claim 13 wherein the second socket of the
2 second plate has first and second side walls that are parallel to each other.

1 24. The implant of claim 13 wherein the first and second side walls
2 of the first plate are parallel to each other and the second socket of the
3 second plate has first and second side walls that are parallel to each other
4 and further wherein the first and second side walls of the first plate are
5 perpendicular to the first and second side walls of the second plate.

1 25. The implant of claim 13 wherein the implant is assembled so
2 that the spacer is positioned within the socket of the first plate and the socket
3 of the second plate.

1 26. The implant of claim 13 wherein the first side of the spacer is
2 curved and the second side of the spacer is curved.

1 27. The implant of claim 26 wherein the first curved side is oriented
2 perpendicular to a curve of the second curved side.

1 28. The implant of claim 13 wherein the first side of the spacer is
2 convex and the second side of the spacer is convex.

1 29. The implant of claim 28 wherein the convex first side is oriented
2 perpendicular to the convex second side.

1 30. The implant of claim 13 wherein the socket of the first plate has
2 first and second side walls that are substantially perpendicular to the first
3 surface of the first plate.

1 31. The implant of claim 13 wherein the socket of the second plate
2 has first and second side walls that are substantially perpendicular to the first
3 surface of the second plate.

1 32. An intervertebral implant comprising:
2 a first plate adapted to mate to a first vertebral body, the first
3 plate including a first socket having a first interior surface;
4 a second plate adapted to mate to a second vertebral body, the
5 second plate including a second socket having a second interior
6 surface wherein the second interior surface has a curved shape and a
7 first wall and a second wall; and
8 a spacer with a first side that fits adjacent the first interior
9 surface of the first socket and a second side that fits adjacent the
10 second interior surface of the second socket.

1 33. The implant of claim 32 including at least one of the first and
2 second plates including a keel extending therefrom and adapted to engage a
3 vertebral body.

1 34. The implant of claim 32 including a first keel extending from the
2 first plate and adapted to engage a first vertebral body, and a second keel
3 extending from the second plate and adapted to engage a second vertebral
4 body.

1 35. The implant of claim 32 wherein the first plate has a first side
2 and a second side, wherein the first side faces the second plate and the
3 second side contacts a surface of the first vertebral body.

1 36. The implant of claim 35 wherein the first side of the first plate
2 and the second side of the first plate are parallel to each other.

1 37. The implant of claim 35 wherein the first side of the first plate
2 and the second side of the first plate are not parallel to each other.

1 38. The implant of claim 32 wherein the first plate has a first side
2 and a second side and the first side of the first plate faces the second plate
3 and the second side of the first plate contacts a surface of the first vertebral
4 body.

1 39. The implant of claim 30 wherein the first socket of the first plate
2 has first and second side walls.

1 40. The implant of claim 38 wherein the first and second side walls
2 of the first plate are parallel to each other within the socket.

1 41. The implant of claim 32 wherein the socket of the first plate has
2 first and second side walls that are substantially perpendicular to the first
3 surface of the first plate.

1 42. The implant of claim 32 wherein the socket of the second plate
2 has first and second side walls that are substantially perpendicular to the first
3 surface of the second plate.

1 43. The implant of claim 32 wherein the first socket of the first plate
2 has first and second side walls that are parallel to each other and the first and
3 second side walls of the second socket are parallel to each other and further
4 wherein the first and second side walls of the first plate are perpendicular to
5 the first and second side walls of the second plate.

1 44. The implant of claim 32 wherein the implant is assembled so
2 that the spacer is positioned within the socket of the first plate and the socket
3 of the second plate.

1 45. The implant of claim 32 wherein the first plate has a first side
2 and a second side and the first side of the first plate faces the second plate
3 and the second side of the first plate contacts a surface of the second
4 vertebral body.

1 46. The implant of claim 45 wherein the first side of the second plate
2 and the second side of the second plate are parallel to each other.

1 47. The implant of claim 45 wherein the first side of the second plate
2 and the second side of the second plate are not parallel to each other.

1 48. The implant of claim 32 wherein the first side of the spacer is
2 curved and the second side of the spacer is curved.

1 49. The implant of claim 48 wherein a curve of the first curved side
2 is perpendicular to a curve of the second curved side.

1 50. The implant of claim 32 wherein the first surface of the spacer is
2 convex and the second surface of the spacer is convex.

1 51. The implant of claim 50 wherein the first convex surface is
2 oriented to lie perpendicular to the second convex surface.

1 52. An intervertebral implant comprising:
2 a first plate adapted to mate to a first vertebral body;
3 a second plate adapted to mate to a second vertebral body; and
4 a spacer with a first convex side and a second convex side and
5 further wherein the first convex side is perpendicular to the second
6 convex side.

1 53. The implant of claim 52 including at least one of the first and
2 second plates including a keel extending therefrom and adapted to engage a
3 vertebral body.

1 54. The implant of claim 52 including a first keel extending from the
2 first plate and adapted to engage a first vertebral body, and a second keel
3 extending from the second plate and adapted to engage a second vertebral
4 body.

1 55. The implant of claim 52 wherein the first plate has a first side
2 and a second side, wherein the first side faces the second plate and the
3 second side contacts a surface of the first vertebral body.

1 56. The implant of claim 52 wherein a socket of the first plate has
2 first and second side walls that are parallel to each other.

1 57. The implant of claim 52 wherein a first socket of the first plate
2 has first and second side walls that are perpendicular to a first surface of the
3 second plate.

1 58. The implant of claim 57 wherein a first socket of the first plate
2 has a curved third side between the first and second side walls.

1 59. The implant of claim 52 wherein the second plate has a first side
2 and a second side, wherein the first side faces the first plate and the second
3 side contacts a surface of the second vertebral body.

1 60. The implant of claim 59 wherein the first side of the second plate
2 and the second side of the second plate are parallel to each other.

1 61. The implant of claim 59 wherein the first side of the second plate
2 and the second side of the second plate are not parallel to each other.

1 62. The implant of claim 59 wherein the second socket of the
2 second plate has first and second side walls that are parallel to each other.

1 63. The implant of claim 59 wherein a socket of the second plate
2 has first and second side walls that are perpendicular to the first surface of the
3 second plate.

1 64. An intervertebral implant comprising:
2 a first plate adapted to mate with a first vertebra;
3 a second plate adapted to mate with a second vertebra;
4 a spacer placed between the first and the second plates;
5 the spacer having first and second curved surfaces that are at an angle
6 to each other with the first curved surface mated with the first plate and the
7 second curved surface mated with the second plate.

1 65. The implant of claim 64 wherein the curved surfaces are
2 cylindrical.

1 66. The implant of claim 64 wherein the curved surfaces are convex.

1 67. The implant of claim 64 wherein the first and second plates each
2 have a curved surface that mates with a curved surface of the spacer.

1 68. The implant of claim 65 wherein the first and second plates each
2 have a cylindrical surface that mates with a cylindrical surface of the spacer.

1 69. The implant of claim 66 wherein the first and second plates each
2 have a concave surface that mates with a convex surface of the spacer.

1 70. The implant of claim 64 wherein the first curved surface has a
2 first axis and the second curved surface has a second axis, and the first axis
3 and the second axis are at an angle to each other.

1 71. The implant of claim 64 wherein the first curved surface has a
2 first axis and the second curved surface has a second axis, and the first axis
3 and the second axis are at about perpendicular to each other.

1 72. An intervertebral implant comprising:
2 a first plate adapted to mate with a first vertebra;.
3 a second plate adapted to mate with a second vertebra;
4 a spacer placed between the first and the second plates; and
5 wherein said spacer in conjunction with the first plate allows rotational
6 motion about a first axis and blocks motion about a second axis, and the
7 spacer in conjunction with the second plate allows rotational motion about the
8 second axis and blocks motion about the first axis.

1 73. The implant of claim 72 wherein said first axis is perpendicular
2 to the second axis.

1 74. The implant of claim 72 wherein the implant can rotate about a
2 third axis that is at an angle to the first axis and to the second axis.

1 75. The implant of claim 1 wherein said first curved surface is about
2 perpendicular to the second curved surface.

1 76. The implant of claim 7 wherein said first convex surface is about
2 perpendicular to the second convex surface.

1 77. The implant of claim 2 wherein at least one of the sockets has
2 one or more crests.

1 78. The implant of claim 2 wherein at least one of the sockets has
2 one or more crests to allow for twisting motion between the first part and the
3 second part.

1 79. The implant of claim 8 wherein at least one of the sockets has
2 one or more crests.

1 80. The implant of claim 8 wherein at least one of the sockets has
2 one or more crests to allow for twisting motion between the first part and the
3 second part.

1 81. The implant of claim 13 wherein at least one of the sockets has
2 one or more crests.

1 82. The implant of claim 13 wherein at least one of the sockets has
2 one or more crests to allow for twisting motion between the first part and the
3 second part.

1 83. The implant of claim 1 wherein the third part is selected from
2 the group consisting of polyetheretherketone, polyetherketoneketone,
3 polyaryletheretherketone, polyetherketone, polyetherketoneetherketone-
4 ketone, and polyetheretherketoneketone.

1 84. The implant of claim 7 wherein the third part is selected from
2 the group consisting of polyetheretherketone, polyetherketoneketone,

3 polyaryletheretherketone, polyetherketone, polyetherketoneetherketone-
4 ketone, and polyetheretherketoneketone.

1 85. The implant of claim 13 wherein the spacer is selected from the
2 group consisting of polyetheretherketone, polyetherketoneketone,
3 polyaryletheretherketone, polyetherketone, polyetherketoneetherketone-
4 ketone, and polyetheretherketoneketone.

1 86. The implant of claim 32 wherein the spacer is selected from the
2 group consisting of polyetheretherketone, polyetherketoneketone,
3 polyaryletheretherketone, polyetherketone, polyetherketoneetherketone-
4 ketone, and polyetheretherketoneketone.